



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 0 831 177 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
05.01.2000 Bulletin 2000/01

(51) Int. Cl.⁷: **D21H 23/04**, D21H 21/10
// D21H17:37

(43) Date of publication A2:
25.03.1998 Bulletin 1998/13

(21) Application number: **97116538.6**

(22) Date of filing: **23.09.1997**

(84) Designated Contracting States:
**AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC
NL PT SE**

(30) Priority: **24.09.1996 US 719283**

(71) Applicant:
**NALCO CHEMICAL COMPANY
Naperville Illinois 60563-1198 (US)**

(72) Inventors:

- **Wong Shing, Jane B.**
Aurora, Illinois 60504 (US)
- **Hurlock, John R.**
Hickory Hills, Illinois 60457 (US)

(74) Representative:

Wibbelmann, Jobst, Dr., Dipl.-Chem.
Wuesthoff & Wuesthoff,
Patent- und Rechtsanwälte,
Schweigerstrasse 2
81541 München (DE)

(54) **Hydrophilic dispersion polymers for paper applications**

(57) A papermaking process comprising forming an aqueous cellulosic papermaking slurry and adding a hydrophilic dispersion polymer to the slurry to increase retention and/or drainage is disclosed. The hydrophilic dispersion polymer comprises (a) a cationic monomer and (b) a second monomer represented by (meth)acrylamide (in an aqueous solution of a polyvalent anionic salt), wherein the polymerization is carried out in the presence of either an organic high-molecular weight multivalent cation comprising a water-soluble polymer containing at least one (a) monomer and/or poly diallyl dimethyl ammonium chloride (DADMAC). After addition of the polymers, the slurry is drained to form a sheet, and the sheet is dried.

EP 0 831 177 A3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 97 11 6538

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	EP 0 308 752 A (NALCO CHEMICAL CO) 29 March 1989 (1989-03-29) * the whole document *	1,2,4,6,7	D21H23/04 D21H21/10 //D21H17:37
X	US 5 334 679 A (YAMAMOTO TAKUSHI ET AL) 2 August 1994 (1994-08-02) * column 2, line 20 - column 3, line 36; examples 1-3,7-9 *	1,2	
X	US 4 696 962 A (DANNER BERNARD ET AL) 29 September 1987 (1987-09-29) * column 1, line 1 - column 2, line 18; examples *	1	
X	EP 0 525 751 A (HYMO CORP) 3 February 1993 (1993-02-03) * page 1 - page 2 *	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			D21H
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 9 November 1999	Examiner Bernardo Noriega, F
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 97 11 6538

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

09-11-1999

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0308752 A	29-03-1989	US 4795531 A	03-01-1989
		AU 2243688 A	23-03-1989
		CA 1321046 A	10-08-1993
		DE 3886491 D	03-02-1994
		DE 3886491 T	07-07-1994
		ES 2010968 T	16-02-1994
		FI 884339 A,B	23-03-1989
		JP 1162897 A	27-06-1989
		JP 2922907 B	26-07-1999
		NO 175160 B	30-05-1994
		NZ 226240 A	27-10-1989
US 5334679 A	02-08-1994	JP 4356509 A	10-12-1992
US 4696962 A	29-09-1987	DE 3327600 A	14-02-1985
		EP 0134756 A	20-03-1985
		ES 534665 A	01-10-1985
		JP 60068013 A	18-04-1985
EP 0525751 A	03-02-1993	JP 5032722 A	09-02-1993
		AU 657556 B	16-03-1995
		AU 2059892 A	04-02-1993
		CA 2074758 A	31-01-1993
		DE 69220546 D	31-07-1997
		DE 69220546 T	11-12-1997
		ES 2103015 T	16-08-1997
		US 5587415 A	24-12-1996